
कागज और संबंध उत्पादों के लिए नमूना चयन
और परीक्षण की पद्धतियाँ

भाग 1 सामान्य पर्पस के लिए परीक्षण की पद्धतियाँ
(दूसरा पुनरीक्षण)

**Methods of Sampling and Test for
Paper and Allied Products**

Part 1 Test Methods for General Purpose
(*Second Revision*)

ICS 85.060

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FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards after the draft finalized by the Paper and its Products Sectional Committee, had been approved by the Chemical Division Council.

The production of paper has increased considerably in the last few years, but the per capita consumption of paper in our country is still one of the lowest as compared to other countries. The production of paper is expected to be roughly doubled in the next five years. It is expected that this standard will be of assistance to the manufacturers for controlling the quality of their products and to the consumers for testing that they get a material of acceptable quality.

In the formulation of this standard, due weightage has been given to international co-ordination among the standards and practices prevailing in different countries and equipment available in this field in the country. This standard gives some of the general methods of test, used more commonly, for paper and allied products. Other methods of test have been covered by different parts of IS 1060.

This standard was first published in 1956. Suggestions were received to modify sampling procedure prescribed in the specification. In the first revision, sampling procedure, method of test for moisture determination and the method for finding rosin sizing were modified. Method of test for oil absorbency and alternate method for water penetration were included. Also, some other minor changes were made in other methods of test to align them with the new developments in the industry.

While carrying out second revision of the standard, the committee responsible for development of this standard observed that standards on individual test method on many tests which are prescribed in this standard have also been developed by adopting ISO standards under different parts and sections of IS 1060. The test methods prescribed in this standard on which latest test method standards which are adoption of ISO standards are available are as follows:

<i>Test method in IS 1060 (Part 1)</i>	<i>Corresponding latest Indian standard (adoption of ISO standard)</i>
Substance or ream weight (<i>clause 6</i>)	IS 1060 (Part 5/Sec 5) : 2021/ISO 536 : 2019 Methods of sampling and test for paper and allied products: Part 5 Methods of test for paper and board, Section 5 Determination of grammage
Thickness and bulk (<i>clause 7 and 8</i>)	IS 1060 (Part 5/Sec 3) : 2014/ISO 534 : 2011 Methods of sampling and test for paper and allied products: Part 5 Methods of test for paper and board, Section 3 Determination of thickness density and specific volume
Moisture content (<i>clause 9</i>)	IS 1060 (Part 5/Sec 2) : 2021/ISO 287 : 2017 Methods of sampling and test for paper and allied products: Part 5 Methods of test for paper and board, Section 2 Determination of moisture content of a lot — Oven-drying method
pH Value (<i>clause 10</i>)	IS 1060 (Part 4/Sec 7) : 2018/ISO 6588 – 2 : 2012 Methods of sampling and test for paper and allied products: Part 4 Methods of test for paper board and pulps, Section 7 Determination of pH of aqueous extracts — Hot extraction method
Ash (at 525 °C) (<i>clause 11</i>)	IS 1060 (Part 4/Sec 2) : 2018/ISO 1762 : 2015 Methods of sampling and test for paper and allied products: Part 4 Methods of test for paper board and pulps, Section 2 Determination of residue ash on ignition at 525 °C

(Continued on third cover)

*Indian Standard***METHODS OF SAMPLING AND TEST FOR
PAPER AND ALLIED PRODUCTS****PART 1 TEST METHODS FOR GENERAL PURPOSE***(Second Revision)***1 SCOPE**

1.1 This standard prescribes method of sampling, preliminary examination of consignment, conditioning and the methods of test for the determination of the following:

- a) Sizing,
- b) Water absorbency,
- c) Oil absorbency, and
- d) Fibre composition (furnish).

1.2 In case, there would be any inconsistency between the requirements of this standard and those of the standard for an individual material, the later shall prevail.

2 REFERENCES

The standards listed below contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

<i>IS No.</i>	<i>Title</i>
1060 (Part 5/Sec 4) : 2014/ISO 535 : 1991	Methods of sampling and test for paper and allied products: Part 5 Methods of test for paper and board, Section 4 Determination of water absorptiveness — Cobb method
4661 : 1999	Glossary of terms used in paper trade and industry

3 TERMINOLOGY

For the purpose of this standard, definitions given in IS 4661 and following shall apply.

3.1 Standard Atmospheric Conditions — A relative humidity of 65 ± 2 percent and a temperature of 27 ± 2 °C provided that in a given series of experiments the temperature does not vary by more than ± 1 °C.

3.2 Quality of Reagents — Unless specified otherwise, pure chemicals shall be employed in tests and distilled water shall be used where the use of water as a reagent is intended.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

4 SAMPLING**4.1 Definitions**

The following definitions as illustrated in Fig. 1 shall apply.

4.1.1 Unit — Quantity of paper of identical specification packed together for convenience in sale, handling and accounting.

4.1.2 Lot — Quantity of paper of identical specification and belonging to the same batch of manufacture.

4.1.3 Sheet — Paper drawn from a selected unit for tests.

4.1.4 Specimen — Sheet cut to given dimensions.

4.1.5 Sample — All the specimens from the same unit or lot.

4.1.6 Test Piece — Piece of paper cut from a specimen for carrying out tests.

4.2 Scale of Sampling

4.2.1 For ascertaining the conformity of the material to the requirements of the relevant material specifications, each lot as defined in **4.1.2** shall be examined separately.

4.2.2 The number of units to be selected from a lot shall be in accordance with col 2 of Table 1 or 2 depending upon the size of the lot as in col 1 of the same tables. Table 1 is for papers of substances up to 250 g/m² and Table 2 is for papers of substances above 250 g/m².

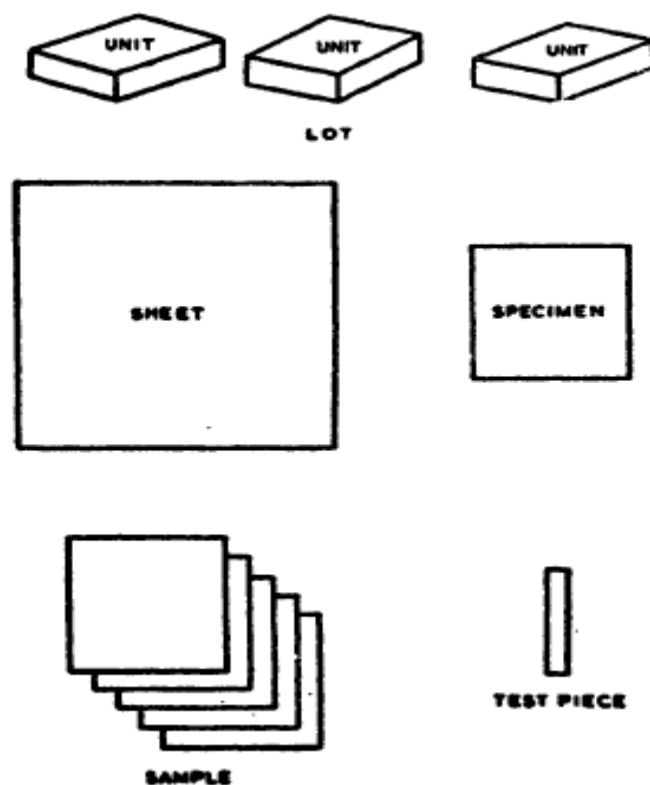


FIG. 1 ILLUSTRATION OF TERMS USED IN SAMPLING

Table 1 Scale of Sampling for Papers of Substances up to 250 g/m²
(Clause 4.2.2)

Sl No.	Number of Units in the Lot	Number of Units to be Selected
(1)	(2)	(3)
i)	Up to 5	All
ii)	6 to 100	5
iii)	101 to 300	8
iv)	301 to 500	13
v)	501 and over	20

Table 2 Scale of Sampling for Papers of Substances above 250 g/m²
(Clause 4.2.2)

Sl No.	Number of Units in the Lot	Number of Units to be Selected
(1)	(2)	(3)
i)	Up to 5	All
ii)	6 to 300	5
iii)	301 to 500	8
iv)	501 to 1000	13
v)	1001 and over	20

4.3 Selection of Units

4.3.1 If the lot is composed of packages (bales or bundles) each containing a number of units in it, at least 20 percent of the packages, subject to a minimum of two, shall be selected at random. From the selected packages, approximately the same number of units shall be selected at random so as to give the requisite number of units required in 4.2.2. At each stage selection shall be at random (see 4.3.3).

4.3.2 If, however, the lot is directly composed of units, the required number of units shall be selected at random in the first stage according to 4.3.3.

4.3.3 For the purpose of random selection, a random number table shall be used. In case a random number table is not available, the following procedure shall be adopted:

Starting from any unit in the lot, count them in any order as 1, 2, 3,..... up to r and so on, where r is the integral part of N/n (N being the number of units in the lot and n the number of units to be selected). Every r^{th} unit thus counted shall be withdrawn from the lot.

4.4 Selection of Sheets

4.4.1 The total number of sheets to be taken from each unit shall be determined by the number of tests required to be carried out on the lot as a whole or on each individual unit or both as specified in the relevant material specifications.

4.4.2 The same number of sheets shall be taken from each selected unit.

4.4.3 The selection of sheets from a unit shall be done at random, the intention being to ensure that the selected sheets fully represent the unit concerned.

4.4.3.1 When the unit is composed of sheets (for example, a ream), remove the outermost sheets and then select the requisite number of sheets at random.

4.4.3.2 When the unit is not directly composed of sheets (for example, a roll or reel), remove all damaged layers from the outside and three undamaged layers in case of paper and one in case of board. Cut the unit across its full width to a sufficient depth to yield the requisite number of sheets after rejecting the sheets from the outer layers. The size of the sheets, if possible, should be approximately 45 cm square with sides parallel to those of the unit.

4.5 Selection and Cutting of Specimens

4.5.1 The dimensions of the specimens should normally be approximately 30×45 cm (in order to allow for their later reduction in the laboratory), the greater of these dimensions being in the machine direction if this is known. If machine direction is not known, select a specimen approximately 45 cm square.

4.5.2 When the sheets selected have dimensions greater than 30×45 cm:

- a) *Paper or Board in Sheets* — Cut specimens, one from each sheet, varying the position of selection every time.
- b) *Paper or Board in Reels* — Cut specimens from each sheet corresponding (approximately) to each 40 cm across the width of the reel.

4.5.3 *When the Sheets Selected have Dimensions less than 30×45 cm but the Surface Area is not less than $1\,000\text{ cm}^2$* — If the surface of the sheet is greater than $1\,000\text{ cm}^2$, from each sheet, select a specimen in such a manner that its surface area is as near $1\,000\text{ cm}^2$ as possible, preferably a little greater. Mark the machine direction if it is not the longer dimension.

4.5.4 *When the Sheets Selected have Dimensions less than 30×45 cm and the Surface Area is less than $1\,000\text{ cm}^2$* — The sheets themselves constitute the

specimen. Select sufficient sheets to provide the required surface area for the determinations.

4.6 Precautions

The following precautions shall be taken in drawing and handling of samples and test pieces.

4.6.1 Care shall be taken to select samples or portions of rolls or reels that are not damaged. It is good practice to discard a few outermost sheets of reams or the first few layers of roll or reel to be sure of obtaining representative samples.

4.6.2 Where portions have to be taken by cutting, they shall be cut across the full width of the undamaged layers.

4.6.3 Samples shall not be taken from an exposed place.

4.6.4 Samples shall be kept flat, free from wrinkles and folds. They shall be protected from exposure to heat, direct sunlight, liquids, varying humidity conditions as well as any other harmful influences.

4.6.5 Samples shall be handled as little as possible and contact with sweated hands shall be strictly avoided. Contact with hands may quite appreciably affect the chemical, physical, optical, surface or other characteristics.

4.6.6 Samples to be tested for moisture shall be placed immediately after sampling in an air-tight container.

4.6.7 Test of strength characteristics shall not be carried out with portions bearing water-marks, creases or any visible imperfections.

4.7 Identification of Specimen

Each specimen shall be provided with identification marks, this being necessary to ensure its recognition beyond all doubts. These marks should be indelible and may be limited to the number of the sampling report and the signature of the sampler. They should be in one corner and as small as possible.

4.8 Number of Tests and Criteria for Conformity

These shall be given in the individual material specifications.

5 PRELIMINARY EXAMINATION OF CONSIGNMENT

5.1 Condition

Check the consignment visually on its receipt to see if it is in sound condition and is free from damage due to improper packing, handling in transit, etc.

5.1.1 Report the condition of the consignment, stating the nature and extent of damage, if any.

5.2 Weight Checking of Lot

5.2.1 Procedure

Weigh the units selected as specified in 4.2.2 on a suitable scale in stacks of convenient size, depending on the capacity and size of the scale. Calculate the weight of the lot on the basis of the weight of the units.

5.3 Visual Examination

5.3.1 Open the reams and the reels in the units selected as under 4.2.2 and test them for the following:

- a) *Reeling* — Examine the reeling to see (1) if it is in one plane and (2) the cores are securely fitted on to reel centres.
- b) *Count* — Verify the number of sheets in the reams to see if they contain the required number of sheets.
- c) *Blemishes* — Examine the material for blemishes, such as specks, pin-holes, patches, creases, folds, cuts and torn sheets and report the defects.
- d) *Size* — Measure, correct to 2.0 mm, the size (length and breadth in the case of ream paper and width in the case of reels) with the help of an accurate metre rule, suitably subdivided. Length in the case of reels is usually calculated from the turnover in sheets from the reel. The width of reels shall not vary more than ± 0.5 percent with a maximum permissible variation of 6 mm. The variation in the measurement of sheets shall be within ± 0.5 percent provided always that, where 0.5 percent is greater than 6 mm, the permissible variation shall be 6 mm and that, where 0.5 percent is less than 3 mm, the permissible variation shall be 3 mm.

6 CONDITIONING

6.1 Since the exact relationship between the moisture content of paper and the results of various tests are unknown, the paper under test shall be conditioned to standard atmospheric conditions (*see 3.1.1*) in a suitable room or chamber, unless otherwise specified in the method of test.

6.2 Procedure

Suspend each specimen, until equilibrium is reached, in a suitable room or chamber maintained at standard atmospheric conditions (*see 3.1.1*) so that conditioning atmosphere has free access to all its surfaces, air being so circulated that the humidity and temperature of the room or chamber are maintained uniformly. The specimen shall be deemed to have reached the equilibrium when the results of two weighings at an interval of not less than one hour between weighings

do not differ by more than 0.25 percent of the total weight. Most common varieties of paper require 4 h to reach equilibrium, but some hard-sized papers and water-resistant and other special papers may require 24 h or longer.

6.2.1 After the specimens for test purposes are conditioned, they shall be handled as little as possible and not breathed on.

7 SIZING

7.1 Qualitative Tests

Various sizing materials are used, among which starch, rosin and gelatine are important. The following methods of test are prescribed for identifying these sizing components.

7.1.1 Starch Sizing

Drop on a test piece with a glass rod a weak solution of iodine in potassium iodide, approximately 0.005 N. Alternatively, treat a hot water extract of the paper with the iodine solution. The appearance of a distinct blue colour indicates the presence of starch, the deeper the colour the greater the quantity of starch.

NOTE — A faint colour shall not be taken as evidence of added starch, as in rag pulp it is very difficult to remove starch from the raw materials.

7.1.2 Rosin Sizing

Take a test piece of paper about 200×25 mm, pleate it repeatedly, place it in a test-tube and cover it with rectified spirit. Place the test-tube in a water-bath maintained at about 75 °C till two-thirds of the rectified spirit has evaporated off. Remove the paper and evaporate the rectified spirit completely. Add 1 ml of acetic anhydride in the tube and dissolve the residue by warming. Cool it and add one drop of sulphuric acid of sp gr 1.53. Formation of a fugitive violet colour indicates the presence of rosin sizing in the paper.

7.1.3 Gelatine Sizing

Cut a small quantity of paper from the specimen and boil for a few minutes in a beaker containing sufficient water to cover the paper. Pour off into a test-tube, cool, add a few drops of 2 percent solution of tannic acid. A flocculent precipitate indicates that the paper has been sized with gelatine. On heating the liquid, the precipitate will coagulate and cling to the sides of the test-tube.

7.1.4 Casein

Make a weak sodium carbonate or sodium borate extract of the paper, filter it off and add dilute acetic acid to the filtrate. Any casein present comes down as a white precipitate; if this is filtered off and washed, it will give a purple coloration on warming with strong hydrochloric acid. If Millon's reagent is used with the

neutralized extract, a red colour develops on warming. This reagent is prepared by dissolving 5 g of mercury in 10 ml of concentrated nitric acid and diluting with 50 ml of distilled water after the mercury has been completely dissolved in the acid.

7.2 Sizing Properties

7.2.1 Resistance of Writing Papers to Feathering

For carrying out a quick performance test for resistance to feathering, write on the surface of a test piece with a latem pattern nib and blue-black superior writing ink. For testing papers which have to stand erasure, such as ledger papers, repeat this test on the same spot after ensuring the original writing. Examine the edges of the writing for definition. The presence or absence of feathering (the irregular spread of ink on either side of the written line) shall be reported. It is indicative of the quality of the sizing.

7.2.2 Test for Water Penetration (Cobb Test)

Cobb test shall be carried out as per IS 1060 (Part 5/Sec 4).

8 WATER ABSORBENCY

8.1 General

This test is intended for unsized and absorbent papers, namely, towelling or blotting papers, and consists in allowing water to be sucked up by a strip of the material and determining the rate.

8.2 Procedure

Cut test pieces of 150×25 mm size from each direction of each specimen. Make a pencil mark parallel to and 10 mm above one of the shorter edges of each test piece and immerse the strip up to the pencil mark in water at 27 ± 2 °C. Note the height in millimetres above the pencil mark to which the water rises in a specified interval of time, the time being taken from the moment of immersion of the test piece in water.

8.3 Report

Report average, maximum and minimum values for each direction separately.

9 OIL ABSORBENCY

9.1 Outline of the Method

This method consists of measuring the time in which a drop of castor oil produces a uniform translucent spot in paper. It is a measure of the receptivity of paper to printing inks having an oil vehicle, but is suitable only for easily permeable papers, such as news, book and mimeograph.

9.2 Apparatus

9.1.1 Viewing Box — Having an open front, a ground-glass top with a 20 mm hole for observing the specimen, a ground-glass partition parallel to the front side to prevent excess heat from affecting the test results, a 15 watt electric bulb placed at the back of the partition for illuminating the specimen and an adjustable mirror near the bottom of the box and centred on the observation hole in the top of the box.

9.1.2 Separatory Funnel — With a tip approximately 20 mm in length and of such diameter that 25 drops of distilled water delivered at 21 °C will have a volume of 1 ml. The funnel is suspended with the end of the tip approximately 45 mm above the test specimen and contains castor oil, the temperature of which is maintained at 27 ± 2 °C during the test.

NOTE — The viscosity of castor oil has been found to vary somewhat. Accordingly, for particular tests, agreement should be reached regarding the specific sample of oil to be used.

9.3 Test Specimens

Select the sample and cut representative specimens, each about 5 cm square.

9.4 Procedure

Place the conditioned specimen over the hole in the top of the box. Let a drop of castor oil fall from the funnel upon the specimen and start stop watch the instant the drop strikes the specimen. Observe the underside of the specimen and measure the time interval from the instant of contact of the oil with the paper until the spot of oil reaches a uniform and maximum translucency. Covering the spot of oil with a cap having a black interior helps in the determination of the end point.

9.5 Report

Report the maximum, minimum and average time of penetration, to the nearest 5 s, for not less than five tests on each side of the paper.

10 FIBRE COMPOSITION (FURNISH) QUALITATIVE TESTS

10.1 Colour Reactions for Highly Lignified Fibres, such as Mechanical Wood

10.1.1 Phloroglucine Solution Test — Make a solution of 1 g of phloroglucine in 50 ml of rectified spirit and 25 ml of concentrated hydrochloric acid. Place a drop of this solution on the test piece. If mechanical wood is present, an intensely red coloration will develop.

10.1.2 Aniline Sulphate Solution Test — A freshly prepared 2 percent (w/v) aqueous solution of aniline

sulphate containing a drop of sulphuric acid gives a yellow coloration with mechanical wood in the cold.

10.2 Microscopic Examination — This method covers the identification of the kinds of fibres present in paper and paperboard.

10.2.1 Apparatus — The following apparatus is required:

- a) *Microscope* — Compound, equipped with a mechanical stage, Abbe condenser eyepiece and achromatic objective. A magnification of 100 diameters is recommended.
- b) *Dropper* — A glass tube, 6 mm internal diameter, 10 cm long, fitted at one end with a rubber bulb to deliver 0.5 ml.
- c) *Slides and cover glasses* — Slides (25 × 75 mm) and cover glasses (25 × 25 mm) of colourless glass. The slides and cover glasses shall be kept in 50 percent alcohol, or washed with it before use.
- d) *Hot-plate* — With a solid metal top capable of heating to 50 to 60 °C.
- e) Dissecting needles

10.2.2 Reagent — Herzberg stain.

- a) *Preparation* — Mix 25 ml of an aqueous solution of zinc chloride saturated at 20 °C with a solution containing 0.25 g of iodine and 5.25 g of potassium iodide dissolved in 12.5 ml of distilled water. Pour into a narrow cylinder and let stand until clear (12 to 24 h). Decant the supernatant liquid into an amber-coloured glass-stoppered bottle and add a small piece of iodine to the solution. Avoid undue exposure to light and air. It is necessary to test the stain on a mixture of fibres known to contain about equal proportions of rag, chemical pulp and mechanical wood. If the colour distinction is not satisfactory, either zinc chloride or iodine shall be added till it is satisfactory.
- b) *Application* — For staining, apply 3 or 4 drops of the stain to the dried fibres, cover the whole with a cover glass in such a manner as to avoid air bubbles, let stand for 1 or 2 min and drain off the surplus with filter paper.

10.2.3 Disintegration of Test Pieces

Shred the test pieces and place in a small beaker. Obtain the approximate weight of the shreds in order

to calculate the proper dilution of the disintegrated test pieces. Cover with 1 percent sodium hydroxide solution (w/v), bring to boil on a hot plate, decant the liquid and wash twice with distilled water. Cover with 0.5 N hydrochloric acid, let stand for several minutes, decant the acid and wash several times with distilled water. Drain off the water, roll the pieces of paper into pellets gently between the thumb and the fingers, put into a 500 ml Erlenmeyer flask, add a little water and shake vigorously until the water is absorbed by the paper. Add more water and shake, and continue this treatment until the paper is thoroughly disintegrated. Dilute the suspension of fibres by pouring away part of it and adding water to the remainder until the suspension has a consistency of about 0.05 percent fibres. Partially fill a test-tube with the mixture.

NOTE — In the case of treated papers (like asphalt, tar, rubber and pyroxylin) and highly coloured papers, the chemical and the dye with which the paper has been treated shall be removed from the specimens by suitable methods before disintegrating the specimens.

10.2.4 Preparation of Slides

Thoroughly mix the test-tube suspension of the test pieces, insert the dropper to the middle of the suspension and withdraw a portion of the mixture. Place 0.5 ml of the suspension immediately on each end of the slide (the test-tube shall be shaken and sample withdrawn separately each time). Evaporate a portion of the water, and carefully distribute the fibres evenly inside the 625 mm² area on the end of each slide with a dissection needle. Leave the slides on the hot plate until completely dried. Stain as described under **10.2.2** taking care that the unstained fibres on the slide are not touched by the fingers. Allow the slide to cool before adding the stain, otherwise confusing colours may be obtained.

10.2.5 Procedure

Examine the prepared slides microscopically, using a magnification of about 100 diameters. The identity of the fibres is given by the colour developed as shown below:

- a) *Wine red* — Linen and cotton,
- b) *Blue* — Chemically prepared fibres low in lignin, from wood, straw, bagasse, bamboo and grasses, and
- c) *Yellow* — Fibres high in lignin, such as mechanical pulp, unbleached bast fibres and jute.

ANNEX A

(Forward)

COMMITTEE COMPOSITION

Paper and its Products Sectional Committee, CHD 15

<i>Organization</i>	<i>Representative(s)</i>
Central Pulp and Paper Research Institute, Saharanpur	DR M. K. GUPTA (Chairman)
Avantha Centre for Industrial Res and Development, Yamuna Nagar	DR NISHIKANT BHARDWAJ
Ballarpur Industries Ltd, New Delhi	SHRI DEEPAK SHARMA SHRI BHUSHAN AWATE (<i>Alternate</i>)
Central Pulp and Paper Research Institute, Saharanpur	DR A. K. DIXIT DR SANJAY TYAGI (<i>Alternate I</i>) SHRI ALOK KUMAR GOEL (<i>Alternate II</i>)
Century Pulp and Paper Mills, Distt Nainital	SHRI SANJAY KUMAR YADAV SHRI SUNESH YADAV (<i>Alternate</i>)
Directorate of Printing, Minx of Urban Development, New Delhi	FRESH NOMINATION AWAITED
DPIIT, Min of Commerce and Industry, New Delhi	FRESH NOMINATION AWAITED
Federation of Indian Agro Paper Mills	NOMINATION AWAITED
Federation of Paper Traders Association of India, Mumbai	SHRI DALIP BINDAL SHRI PIYUSH JAIN (<i>Alternate</i>)
Government printing, West Bengal	SHRI SUBIR KUMAR MANDAL
Gujarat Paper Mills Association	SHRI PRABHAT RANJAN SHRI KANU MEHRA (<i>Alternate</i>)
Indian Agro and Recycled Paper Mills Association, New Delhi	DR B. P. THAPLIYAL DR ANIL NAITHANI (<i>Alternate</i>)
Indian Institute of Packaging, Mumbai	DR TANWEER ALAM DR MADHAB CHAKRABORTY (<i>Alternate</i>)
Indian Institute of Technology, Roorkee	DR DHARM DUTT DR VIBHORE KUMAR RASTOGI (<i>Alternate I</i>) DR KIRTIRAJ K. GAIKWAD (<i>Alternate II</i>)
Indian Paper Manufacturers Association, New Delhi	MR BISWARANJAN DASH MR ROHIT PANDIT (<i>Alternate</i>)
Indian Newsprint Manufacturers Association, New Delhi	SHRI VIJAY KUMAR SHRI ASHISH A GUPTA (<i>Alternate I</i>) K. RAJKUMAR (<i>Alternate II</i>)
Indian Recycled Paper Mills Association, New Delhi	SHRI R. C. RASTOGI
JK Paper Ltd, N. Delhi	SHRI MAHESH NARAYAN BHAT
Kumarrappa National Handmade Paper Institute, Jaipur	MS SAAKSHY
Ministry of Railways, Railway Board, New Delhi	SHRI C. RAVINDRAN
NCERT, New Delhi	SHRI ARUN CHITKARA
Pulp and Paper Research Institute, Jaykaypur, Orissa	SHRI S. K. PRADHAN DR S. P. SINGH (<i>Alternate</i>)

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<i>Organization</i>	<i>Representative(s)</i>
Seshasayee Paper and Boards Limited, Erode	SHRI A. K. MEHROTRA DR P. MARIMUTHU (<i>Alternate</i>)
Shree Mangal (Trade) Enterprises	SHRI NAROTTAM VYAS MS BHAWNA VYAS (<i>Alternate</i>)
Stationery Office, Govt of India, Kolkata	SHRI JALIS AHMED SHRI SWAPAN KANTI GHOSH (<i>Alternate</i>)
Tamilnadu Newsprint and Papers Ltd, Tamilnadu	SHRI P. SANKARALINGAM SHRI N. K. PERIASAMY (<i>Alternate</i>)
Voluntary Organization in Interest of Consumer Education, N. Delhi	SHRI M. A. U. KHAN SHRI H. WADHWA (<i>Alternate</i>)
Whale Stationery Products Ltd, New Delhi	SHRI MUKESH GUPTA SHRI GAURAV GOEL (<i>Alternate</i>)
BIS Directorate General	SHRI A. K. LAL, SCIENTIST 'E' AND HEAD (CHD) [REPRESENTING DIRECTOR GENERAL (<i>Ex-officio</i>)]

Member Secretary

SHRISHTI DIXIT
SCIENTIST 'D' (CHD), BIS

(Continued from second cover)

<i>Test method in IS 1060 (Part 1)</i>	<i>Corresponding latest Indian standard (adoption of ISO standard)</i>
Ash (at 900 °C) (<i>clause 11</i>)	IS 1060 (Part 4 / Sec 3) : 2018/ISO Methods of sampling and test for paper and allied products: Part 4 Methods of test for paper board and pulps, Section 3 Determination of residue ash on ignition at 900°C
Tensile strength and elongation (<i>clause 12.3</i>)	IS 1060 (Part 5/Sec 6) : 2014/ISO 1924-2 : 2008 Methods of sampling and test for paper and allied products: Part 5 Methods of test for paper and board, Section 6 Determination of tensile properties — Constant rate of elongation method 20 mm min
Bursting strength of paper (<i>clause 12.5</i>)	IS 1060 (Part 6/Sec 2) : 2014/ISO 2758 : 2001 Methods of sampling and test for paper and allied products: Part 6 Methods of test for paper, Section 2 Determination of bursting strength of paper
Bursting strength of board (<i>clause 12.5</i>)	IS 1060 (Part 7/Sec 1) : 2014/ISO 2759 : 2001 Methods of sampling and test for paper and allied products: Part 7 Methods of test for board, Section 1 Determination of bursting strength of board
Folding endurance (<i>clause 12.6</i>)	IS 1060 (Part 6/Sec 3) : 2015/ISO 5626 : 1993 Methods of sampling and test for paper and allied products: Part 6 Methods of test for paper and board, Section 3 Determination of folding endurance of paper
Tearing resistance (<i>clause 12.7</i>)	IS 1060 (Part 6/Sec 1) : 2014/ISO 1974 : 2012 Methods of sampling and test for paper and allied products: Part 6 Methods of test for paper, Section 1 Determination of tearing resistance —Elmendorf method
Cobb test (<i>clause 13.2.2</i>)	IS 1060 (Part 5/Sec 4) : 2014, ISO 535 : 1991 Methods of sampling and test for paper and allied products: Part 5 Methods of test for paper and board, Section 4 Determination of water absorptiveness — Cobb method
Gloss (<i>clause 15</i>)	IS 1060 (Part 5/Sec 12) : 2021/ ISO 8254-1 : 2009 Method of sampling and test for paper and allied products: Part 5 Method of test for paper and board, Section 12 Measurement of specular gloss 75 degree gloss with a converging beam TAPPI method
Opacity (<i>clause 16</i>)	Opacity shall be determined as per method prescribed in IS/ISO 2471 : 2008 Paper and board determination of opacity paper backing diffuse reflectance method

The committee, therefore, decided to revise this standard again by deleting the above test methods from this standard as more updated and advance test method standards are available.

The composition of technical committee responsible for formulation of this standard is given in Annex A.

In reporting the result of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS 2 : 1960 'Rules for rounding off numerical values (revised)'.

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Amendments Issued Since Publication

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